Human Performance Improvement

W. Earl Carnes

Human Performance Center EH-2

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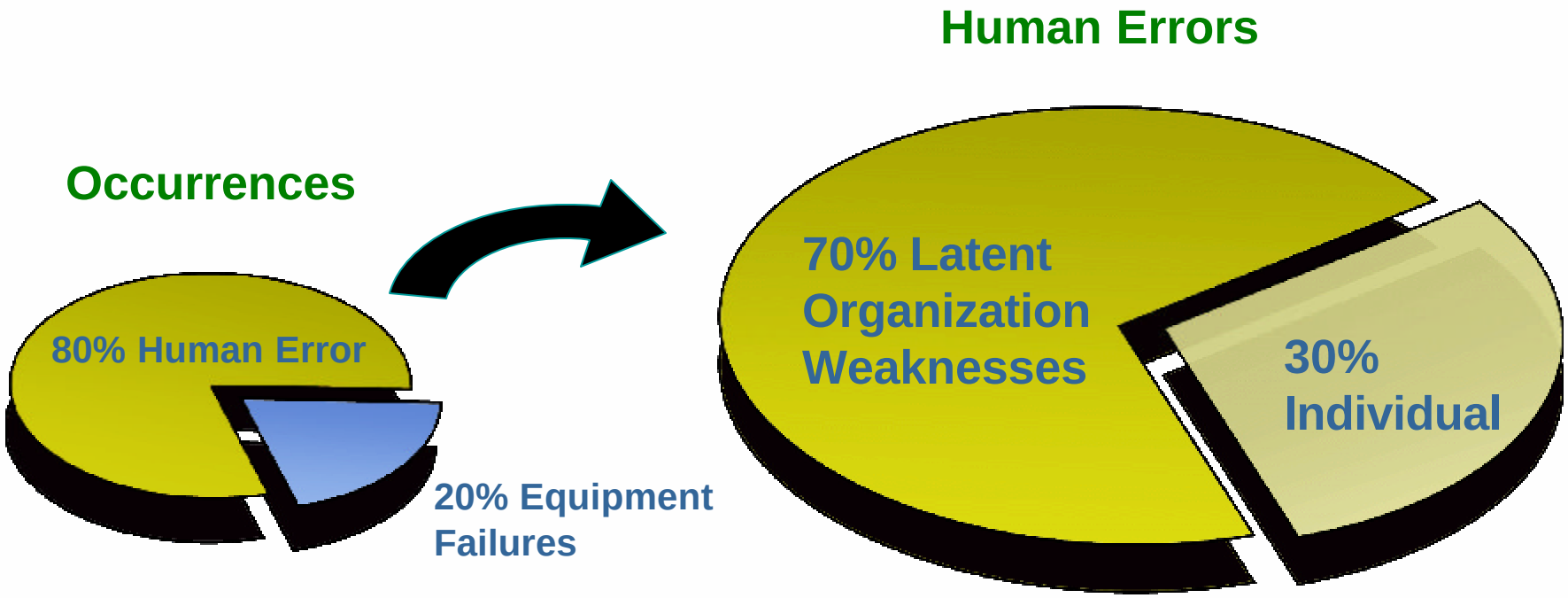
Human Performance Improvement

HPI is the proactive integration of basic tenets of human behavior into work management systems

- **Creating an organizational environment that values errors as leading data for identifying error-prone conditions**
- **Developing error tolerant systems by eliminating latent organizational weaknesses and by building defenses in depth**
- **Recognizing the fallibility of human kind, the power of reinforcement and the consequences of fear and blame**

Why a Human Performance Approach?



Human Error

Two related definitions

- An unintentional deviation from an approved behavior
- Failure of planned actions to achieve their desired goal

Principles of Human Performance

1. People are fallible, and even the best make mistakes
2. Error-likely situations are predictable, manageable and preventable
3. Individual behavior is influenced by organizational processes and values
4. People achieve high levels of performance based largely on the encouragement and reinforcement received from leaders, peers and subordinates
5. Events can be avoided by understanding the reasons mistakes occur and applying the lessons learned from past events

Two Diverse Views of Human Error

The Old View of Human Error

- Human error is the cause of accidents
- To explain failure you must seek failure
- You must find people's inaccurate assessments, wrong decisions and bad judgments

The New View of Human Error

- Human error is a symptom of trouble deeper inside a system
- To explain failure, do not try to find where people went wrong
- Instead, find how people's assessments and actions made sense at the time, given the circumstances that surrounded them

Two kinds of Accidents

- Those that happen to individuals
- Those that happen to organizations

Characteristics of Individual Accidents

- Large in number
- Often the result of a single cause
- Person or group is often both the agent and victim
- The consequences to the people concerned may be great, but their spread is limited
- The nature (not necessarily the frequency) of these accidents remain relatively unchanged over the years

Characteristics of Organizational Accidents

- Happen within complex modern technologies
- Occur very rarely & are hard to predict or foresee
- Have multiple causes involving many people
- Can have devastating effects on uninvolved populations, assets and the environment
- Are the product of technological innovations which have radically altered the relationship between systems and their human elements.

Examples of Organizational Accidents

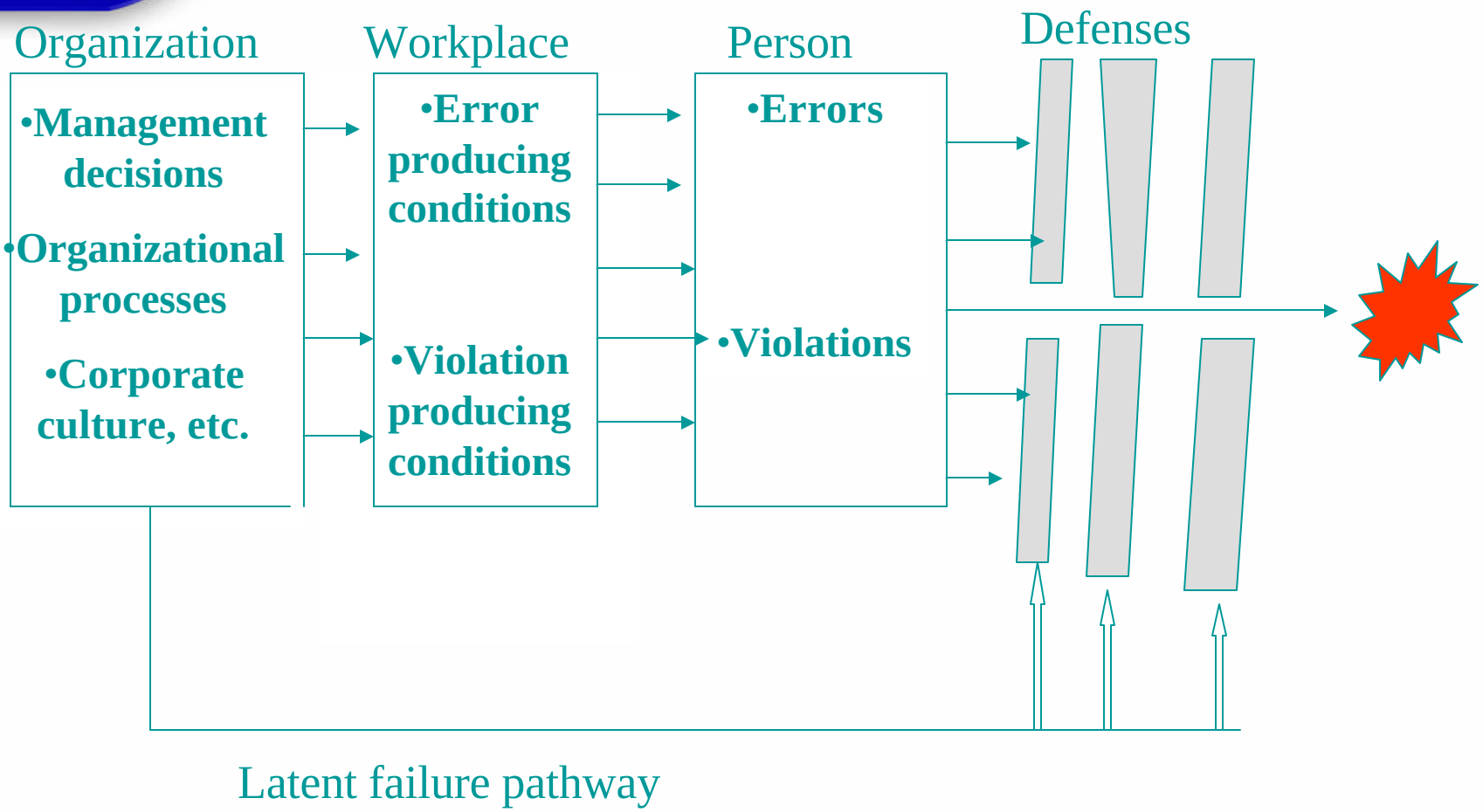
- Apollo 13 oxygen tank blow out (1970)
- Three Mile Island loss of coolant near-disaster (1979)
- Chicago DC 10 crash at O'Hare (1979)
- ❖Bhopal India release of methyl isocyanate gas (1984)
- Piper Alpha oil and gas platform explosion North Sea ('88)
- Clapham Junction rail collision in England (1988)
- Phillips 66 chemical explosion in Texas (1989)
- Embraer 120 in-flight structural break in Texas ((1991)
- Loss of B757 in Dominican Republic (1996)
- DC9 oxygen generator fire over Florida (1996)
  - ❖Bhopal was the worse industrial accident in history

Commonalities of Organizational Accidents

- Latent conditions are always present in complex systems.

  They lie dormant for a time doing no particular harm until they interact with local circumstances (task conditions and work area situations) to defeat the system's defenses
- Errors or human failures are not the principal causes
- There is a breakdown in the process of checking and reviewing defenses
- People involved 'forget' to be afraid. Accidents occur because people do not believe that the accident that is about to occur is at all possible.

Stages of an Organizational Accident



The reconstruction of mindset does not begin with the mind

It begins with the circumstances in which the mind found itself

New Paradigm

Re + Md ? ØE

[reducing error AND managing defenses leads to zero events]

Individual + organization & processes >>>> Performance Improvement

Reducing Errors

Managing Defenses

Zero Accidents

Improving performance at the corporate level

- We have to create a ‘just’ culture within DOE that holds people accountable for willful violations but holds people blameless for committing unintentional errors.
- We must create a ‘reporting’ culture that encourages workers to report errors and near misses— to help us to identify recurrent event patterns, error traps and gaps or weaknesses in defenses
- We need to become a ‘learning’ culture in which we learn from our mistakes

Create a Just Work Environment within DOE: Immediate Actions

- Integrate HPI philosophy into ISM
- Review DOE causal analysis documents and training
- Review DOE accident investigation processes and training
- Work with key personnel with the complex who can influence a “Just” work environment
- Encourage reporting of errors, error likely situations and latent organizational weaknesses

Create a Just Work Environment within DOE: Future Actions

- Capture DOE & contractors' ideas on what it would take to create a "Just" work environment
- Review available data from occurrence reports, accident investigations, corrective actions, etc. against the concepts of a "Just" work environment – to identify potential "latent organizational weaknesses"
- Institutionalize HPI as a DOE-accepted improvement approach

What Individuals can do to Reduce Errors

- Understand error-provoking factors and human vulnerabilities
- Anticipate error likely situations
- Apply error prevention tools (3-way communication, pre-job briefings, self-checking, peer-checking, independent verification, place-keeping procedure adherence, questioning attitude and the like)
- Improve personal capabilities

What Organizations can do to Reduce Errors

- Foster a culture that values the prevention of mishaps
- Preclude the development of error-likely situations
- Eliminate latent organizational weaknesses that provoke error
- Create a learning environment that promotes continuous improvement
- Report errors and near misses